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MYTHS AND REALITIES OF CHEMICAL SAFETY

MANAGING AGRICULTURAL TECHNOLOGY FOR PROFIT

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Every season, Alberta producers use a number of chemical pesticides to control weeds, insects or diseases in their crop. Most of these chemicals are not very toxic but because they are used quite heavily by many producers, hundreds of poisoning cases occur every year. There are also some very toxic pesticides that are used and, as expected, these cause another few hundred poisonings per year.

Some farmers are very careful when handling pesticides as they use the necessary safety gear to reduce exposure. Most of the others are very careless and these are the ones that have the most poisonings.

This lackadaisical attitude could be blamed on many things, perhaps on some of the myths that farmers have come to believe in over the years. I will now take a look at three of these myths and attempt to dispel them by looking at the realities.

Myth #1: This pesticide is so safe, you can drink it.

This is a very dangerous myth as it suggests that there is no hazard associated with the use of certain pesticides. I would in no circumstance suggest that you drink any pesticide. Nor would I suggest that there is no hazard associated with its use. A pesticide with low toxicity can become hazardous if a person is exposed to a high amount.

What is the toxicity of a pesticide? It is the amount that is required to kill half the number of experimental rats in a group. For example, suppose there are 10 rats in a group and each, weighing 1 kilogram (kg), is fed 1 gram (g) of a pesticide. If 5 rats died within

24 hours, the toxicity of that pesticide is 1 gram. The toxicity is the same as the LD_{50} or the dose (D) that is lethal (L) to 50 percent of the animals in the group. LD_{50} is measured in milligram (mg) of pesticide given to the rat for every kilogram body weight of the rat (expressed as mg/kg). For example the LD_{50} in this example is 1 gm/kg or 1,000 mg/kg.

The lower the amount of a pesticide that is needed to kill 50% of a group of rats, the lower is the LD_{50}, and the more toxic is the pesticide. For example Furadan has an LD_{50} value of 11 mg/kg whereas malathion has an LD_{50} of 2,500 mg/kg. Furadan is therefore much more toxic than malathion. The following table gives the LD_{50} of some commonly used pesticides.

Pesticide	LD_{50} (mg/kg)
Temik	1
Lannate	20
Lorsban	160
Reglone	230
Avenge	270
2,4-D	300
Sevin	500
Avadex	1,600
Roundup	4,000
Treflan	10,000

Usually those pesticides with LD_{50}'s between 1-500 bear a hazard symbol made up of a stop sign with a skull and crossbones on their labels. Pesticides with LD_{50}'s between 500-1,000 have a diamond plus skull and crossbones, whereas those with LD_{50}'s between 1,000-2,500 have a triangle plus skull and crossbones. Pesticides with LD_{50}'s above 2,500 bear no symbol as they are considered to be of very low toxicity.

Those pesticides with low LD_{50}'s may cause poisoning with a short period of exposure whereas those with high LD_{50} values may cause poisoning only after very lengthy exposure. Therefore, it is important to know the LD_{50} of the pesticide you are using, or at least the hazard symbol on the label.

Check Alberta Agriculture's blue book for the LD_{50} of each pesticide used in this province. Get your copy today.

Myth #2: I have been handling these chemicals for years and I have never felt better.

This is possibly true for those small producers who use a small amount of chemicals every season. The likelihood of them getting poisoned from the low toxicity chemicals such as the herbicides is low. And even if they have to use insecticides such as Furadan for grasshoppers or flea beetles, they may not be exposed to enough of the chemical to experience any problems.

However, ask those large producers who had to spray grasshoppers 4 or 5 times with Furadan last year. Many had problems from heavy exposure.

During the summer of 1983, I did a survey among 500 producers to find out what health problems they may have experienced from using pesticides. Nearly 10 percent of those surveyed had experienced symptoms during that year. The symptoms were caused by some of the less toxic but heavily used herbicides such as 2,4-D, Avadex, Avenge, Treflan and Carbyne. The insecticides mentioned as causing problems were the dual-purpose seed treatments such as Vitavax Dual, N-M Dual, etc. and the grasshopper insecticide Furadan.

The nearly 5,000 people who had experienced ill effects mentioned nausea, abdominal cramps, chest tightness, and blurred vision as the major symptoms.

So, many producers may have been handling pesticides for years and not had any ill effects. However, there are many others who have had problems: some at least once within the last five years and a couple more than once every year for the last five years.

Myth #3: Respirator, goggles, gloves, and coveralls have to be worn all the time when a producer is using chemicals.

Many producers believe that they have to wear a respirator, goggles, and gloves every time that they work with pesticides - in other words, all these things have to be worn for all the chemicals. However, this is not the case. Only for some very toxic chemicals all the equipment has to be worn. For less toxic chemicals, no respirator is needed; only goggles and gloves may be required. For the least toxic chemicals, only gloves are required.

To know what safety gear has to be used with what chemical, read the "Precautions" section on the pesticide label. Generally, coveralls should be worn at all times regardless of the toxicity of the chemical. Those pesticide labels that bear a high hazard symbol require the use of respirator, goggles, gloves and coveralls. The moderate hazard pesticides require goggles, gloves and coveralls, and the low hazard ones require gloves and coveralls. These recommendations apply to when the concentrated formulation is being mixed in the sprayer tank. However, when a producer is spraying the chemical, the safety gear that should be worn would depend on the toxicity of the chemical and the amount of exposure. If the chemical has a high hazard symbol, respirators, goggles and coveralls may be needed while a producer is spraying. With moderate and low hazard chemicals coveralls may be the only gear needed.

In my seminar presentation, I will expand on these and a few other myths that some producers have come to believe in, and discuss the realities surrounding the use of agricultural chemicals.